

Abstract

Apparatus is disclosed for providing auxiliary cooling and thermal stability to a temperature sensitive opto-electronic component, the apparatus comprising a primary thermal control system having a first thermal connection with a primary structure supporting at least one component of an optical system and a second thermal connection being thermally connected with an external environment; and an auxiliary thermal control system having a first thermal connection being thermally connected with the temperature sensitive opto-electronic component, and the auxiliary thermal control system having a second thermal connection being thermally connected with the primary thermal control system whereby the auxiliary thermal control system provides cooling to the temperature sensitive opto-electronic component and the primary thermal control system provides additional cooling to the auxiliary thermal control system through temperature regulation of the primary structure. In one preferred embodiment of the present invention, the first thermal connection between the auxiliary thermal control system and the temperature sensitive opto-

electronic component is structurally compliant so as to  
compensate for thermal expansion or contraction without  
effecting an optical alignment of the temperature  
sensitive opto-electronic component relative to the  
primary structure. In a preferred embodiment of the  
invention, targeted cooling power is provided to a  
selected opto-electronic device with an auxiliary  
cooling system so as to consume less power by cooling  
the selected opto-electronic device and allowing other  
components to function at a higher temperature. A  
method is disclosed for providing auxiliary cooling and  
thermal stability to the temperature sensitive opto-  
electronic component, the method comprising providing  
an auxiliary control system, and cooling the  
temperature sensitive opto-electronic component with  
the auxiliary thermal control system.